Gateway

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The ARRL Packet-Radio Newsletter

WØRLI PBBS VERSION 6.12

Version 6.12 of the WØRLI PBBS software is now available from the usual sources. This version provides the ability to send parameter changes to the TNC at forwarding time and also includes some enhanced commands.

SEVENTH COMPUTER NETWORKING CONFERENCE

The ARRL Seventh Annual ARRL Amateur Radio Computer Networking Conference is scheduled for Saturday, October 1 at the Johns Hopkins Applied Physics Laboratory (APL) in APL's Kossiakoff Center. It will be hosted by the packeteers of the Washington-Baltimore area. The facility has an auditorium that will seat approximately 500. In addition, two classrooms have been reserved for a large open area for show 'n' tell exhibits.

Those intending to attend the conference will have to register in advance. A fee of $20 includes admittance into the conference, lunch and a copy of the Conference Proceedings (advanced registration is required so that a contract with the caterer can be completed). If you register late, a sizeable penalty will be charged ($30). Registration will be handled by Don Bennett, K4NGC.

A list of recommended hotels and motels in the Columbia-Laurel (Maryland) area will be published soon. Attendees will have to make their own reservations. The locals will do what they can to help with special problems.

As usual, the ARRL will publish the Conference Proceedings. The deadline for camera-ready manuscripts is August 25. Contact ARRL headquarters for an author's kit.

Sponsoring organizations of the conference include the ARRL, APL ARC, TAPR, AMSAT, AMRAD and VPRA.

from Tom Clark W3IWI
via CompuServe's HamNet

FIRST ASIANET SYSOP CONFERENCE

Plans for the inaugural AsiaNet PBBS SYSOP Conference are underway. The conference will be held September 3-4, 1988, in Brisbane, Australia at the Gazebo Hotel. The venue is located on Wickham Terrace, approximately 20 minutes from Brisbane International Airport, a five minute walk from downtown Brisbane and a 15 to 20 minute walk from the Expo complex.

The conference is being hosted by the Queensland Amateur Radio Data and Teletype Association (QARDATA), the Queensland Digital Group (QDG) and the Wireless Institute of Australia (VK4 Division). An informal social get-together is tentatively scheduled for Friday, September 2 at the home of Brian Beamish, AX4AHD, at 35 Chester Road, Eight Mile Plains, Queensland.

It is anticipated that many local and international delegates from various digital and packet radio groups and Amateur Radio societies will attend the conference. SYSOPs from Australia, Japan, Indonesia, New Zealand, Philippines and West Malaysia have indicated that they will attend the conference.

The program for the conference has yet to be announced, however, major topics for consideration include the following:

- o PBBS forwarding plans for AsiaNet
- o Satellite and HF packet radio links
- o TCP/IP networking and development
- o Band planning for packet-radio development on HF
- o Developments in HF packet-radio forwarding technology
- o Frequency coordination of closed and opened HF PBBSs
- o Super-narrow FM 1200-baud forwarding
- o AsiaNet International Association
- o Emergency and NTS-type traffic handling
- o Third party traffic restrictions
- o Forthcoming IARU Region 3 Conference
- o Standard format for bulletin groups
- o AMSAT-DL Phase 3-D 56-kbit/s experiment to link AsiaNet using transponder or digipeater
- o AsiaNet Software Exchange Library

If you would like to present a paper or talk at the conference or have some ideas on what should be discussed at the conference, please let the conference coordinator (AX4AHD) know soon so that the paper or discussion may be scheduled.

For further information, contact Brian Beamish, AX4AHD SYSOP @ AX4BBS, telephone 07-341-4767 (home) or 07-394-2555 (business), FAX 61-7-394-4316 or mail to PO Box 254, Stones Corner, QLD 4123, Australia.

from Gil Mays, VK6AGC @ VK6AGC

WESTERN U.S. NETWORK MAP

N7EOJ is now the keeper of the N7HPR packet-radio network map of the Western United States (N7PHR has moved to Florida). This regularly updated map indicates the location of digipeaters, nodes, PBBSs, HF gateways and the interconnecting network in California, Colorado, New Mexico and the W7 call district. It is available by sending an SASE to Budd Turner, N7EOJ, 412 N. Belvedere Av, Tucson, AZ 85711.

from Budd Turner, N7EOJ @ W1FJI

AMSAT OSCAR 13 UPDATE

In the third and final segment of a flawless trek from a jungle launch pad to its orbital residence for the next millennium or so, AMSAT OSCAR 13 (AO-13) has fulfilled a decade-old plan that two prior efforts failed to achieve. It has become history's first OSCAR in a Molniya-type orbit. This momentous event was culminated in a dramatic go-for-broke in-orbit maneuver consisting of a 5.5 minute burn of AO-13's kick motor. Early indications are that the burn was perfect yielding close to the best expectation for orbital plane change and apogee target.

The first step to orbit was a flawless launch to geosynchronous transfer orbit by the new Ariane-4 launcher of the European Space Agency June 15. All three satellites launched by Ariane mission V-22 have now successfully attained their final orbits.

The second step for AO-13 took place a week after launch when, on June 22, the kick motor was ignited for the first time. The result was an intermediate orbit with perigee at 1081 km and inclination raised to 14.3 degrees.

Beginning immediately after the first burn, re-orientation and spin-up proceeded. By July 2, AO-13 had attained the desired second burn attitude (-59 degrees longitude, -70 degrees latitude in the Bahn coordinate system). By July 6, the spin rate reached the desired 60 rpm.

Thus, the stage was set for the third and climactic step. It had been decided to raise the target perigee to approximately 2200 km to add some margin for error and to increase subsequent Southern Hemisphere coverage. The increased margin for error was desired since even a relatively minor propulsion system "hiccup" at the wrong moment could spell disaster.

The 5.5 minute rocket engine burn began at 21:05 UTC, July 6. The burn added about 1 mile per second to AO-13's orbital velocity. The plane of the orbit was raised to about 58 degrees and the perigee was raised to about 2500 km.

AO-13 reached its near-Molniya orbit where two prior attempts have failed. Phase 3A was lost in 1980 when Ariane mission L-02 failed and was destroyed. In 1983, Phase 3B (which became AO-10) made it to geosynchronous transfer orbit aboard Ariane L-06 and achieved an initial motor burn but was unable to re-ignite the motor later because of a suspected propulsion system leak. The Phase 3 Program began with early planning in 1976 as a follow-up to AMSAT OSCAR 7, the first OSCAR to use Mode B. AMSAT OSCAR 8 was built as a gap-filler when it appeared the first Phase 3 satellite would not be available until after AO-7 died. Thus, with AO-13 finally reaching the Phase 3 objective orbit first outlined in 1976, it caps a 12 year-plus program costing well over $1 million.

Phil Karn, KA9Q, provided his best estimate of the orbit, as follows:

```
Satellite:      OSCAR 13
Catalog number:  19216
Epoch time:       88190.00000000
    Fri Jul  8 00:00:00.0   1988 UTC
Element set:     KA9Q-5
Inclination:        58.9522 deg
RA of node:        247.7443 deg
Eccentricity:       0.6545803
Arg of perigee:    187.1127 deg
Mean anomaly:      293.2909 deg
Mean motion:         2.09619370 rev/day
Decay rate:          0 rev/day^2
Epoch rev:          49
Semi major axis:  25789.393 km
Anom period:        686.959416 min
Apogee:           36292.717 km
Perigee:           2530.260 km
Ref perigee:       3841.08839978
    Fri Jul  8 02:07:17.740 1988 UTC
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All that remains to be done before turning on AO-13's transponders is to reorient the satellite to a suitable operational attitude and spin it down to about 30 r/min. With work on bringing AO-13 to full operational readiness going so well, initial plans for opening the satellite to operation have been announced. If all continues to go well, AO-13 could be on the air by July 20.

Here is the preliminary AO-13 operating schedule.

Mode	From	Thru	Duration MA	Minutes
Off	MA 225	MA 29	61	163.7
B	MA 30	MA 97	68	182.5
L (1)	MA 98	MA 157	60	161.0
JL (2)	MA 98	MA 157	60	161.0
B	MA 158	MA 224	67	179.8
S (3)				
RUDAK	Concurrent with Mode L			

(1) daily
(2) weekends only
(3) Mode-S operations will commence when sun angles permit, likely in September

Each MA (Mean Anomaly) unit equals 2.6834 minutes. This is calculated by taking the period of the orbit (686.96 minutes) and dividing it into 256 equal parts. The MA clock resets to zero at perigee. Half way through the orbit, the MA clock equals 128 at apogee.

from AMSAT NA News Service

A LOOK AT LANS AND WANS

What follows is simply an appeal that we apply some degree of frequency coordination within the digital allocations on 2-meter FM. We have noted rapid growth in the Washington, DC area with over 38 PBBSs, 35 digipeaters and a number of NET/ROMs and TCP/IP nodes spread over the 100-kHz segments starting at 145.0, 145.5 and 145.6 plus 221 MHz. The nature of packet radio is quite forgiving in accommodating multiple users and a mix of services on any one frequency, but, condoning a total free-for-all mixture cannot possibly result in an efficient network. The opposite extreme of total coordination and rule making is restrictive and abhorred by most radio amateurs.

The following scenarios illustrate the two extremes of purely local-area networks (LANs) and wide area LANs.

Scenario 1: Nine LANs on the same frequency with nine users using nine different local PBBSs with no contention. There is no hidden-transmitter problem, and each user gets 100 percent of the channel during his session.

Scenario 2: One wide area network (WAN) with eight users using eight different PBBSs through a wide-area digipeater or node. A full-duplex repeater is required to solve the hidden-transmitter problem.

What I hope to show is that LANs should be kept relatively limited in range and that WANs may cover as much area as they need, but that the two functions should be on separate frequencies to optimize the efficiency of both.

Scenarios 1 and 2 have the same users and the same services, but, in order to have the same performance, the full-duplex repeater and all of the users and services in Scenario 2 will have to operate at eight times the data rate as those same users in Scenario 1. Since the full-duplex repeater occupies two frequencies, the overall efficiency in this worst case example is 16-to-1 in favor of the Scenario 1 approach. Ma bell was no dummy when she invented cellular!

However, to make cellular work, there has to be cell-to-cell or LAN-to-LAN connectivity. This is where the WAN of Scenario 2 plays its best role. The wide area full-duplex repeater is an optimum solution to moving LAN-to-LAN traffic in this example. The wide area repeater is also optimum where a given community of users whose traffic statistics look like a LAN are widely geographically distributed. There is an equal need for this capability in the area.

I want to argue that delivering mail via the present PBBSs is a purely local function. Our goal should be that every ham has access to at least one mail drop system. We have reached that condition here in the Washington, DC area and we should optimize that function, but not at the expense of others, through reasonable frequency management. With most PBBS software supporting multiple ports and frequencies, the separation of user access from forwarding channels is going well and must continue to be encouraged. This establishes the basic cellular LAN structure.

The second part of the cellular equation is minimizing interference through geographical distribution and power limitations. Since most PBBS stations are located at home stations with typical antenna heights, they serve as a good cell center model. They should be balanced with their users so there is no need to have one kilowatt power levels if the user is typically only running 25 watts. The following recommended power levels for PBBSs, digipeaters, NET/ROMs and other 24-hour services on the LAN frequencies should not be too restrictive to the typical ham station which is being used as a cell service provider, but it does discourage the installation of alligators, which are disruptive over large areas on LAN frequencies.

Antenna Height Above Average Terrain (ft)	Recommended Power Level (W)
1000	0.1
300	1.0
100*	10
75	25
50	40
25	150

* I would prefer to make 100 ft a top limit.

This proposal places no restrictions on who can operate on LAN frequencies, only on the area of their influence. In fact, all forms of digital services are equally welcome including PBBSs, digipeaters, NET/ROMs, repeaters and TCP/IP operations, although some of these would be less useful than others under the LAN restrictions. Home users would even be encouraged to leave their stations in the unattended digipeater mode to assist connectivity within the LAN. Anyone may also operate his station at any power level and at any height, but not as an unattended service provider on the LAN frequency. Direct PBBS forwarding would be permitted where needed, but long-haul, digipeated and PBBS-forwarding should be limited to non-prime hours.

This proposal has no intent to establish particular cells or to provide exclusive protection for any particular cell. Rather, it is intended to simply provide a protective framework for the LAN concept. A few frequencies are required so that multiple services in a close geographical area can choose separate frequencies. It would seem that three or four frequencies should fill this need. Finally, this proposal cannot work without wide area-systems. Without WANs, packet radio would appear too restrictive to the average ham who wants to exploit his full potential. I strongly support all WAN initiatives. Separating the two will help the hams have the best of both worlds.

from Bob Bruninga, WB4APR @ WB4APR

GATEWAY CONTRIBUTIONS

Submissions for publication in Gateway are welcome. You may submit material via the US mail to:

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or electronically, via CompuServe to user ID 70645,247. Via telephone, your editor can be reached at 203-879-1348 on evenings and weekends, and he can switch a modem on line to receive text at 300, 1200, or 2400 bauds.

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